

White Chuck Watershed Analysis

Chapter 4 Findings Synthesis, and Recommendations

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Introduction

Synthesis is the process the watershed analysis team uses to identify and evaluate linkages between the physical and biological functions and processes in the analysis area. Synthesis considers all domains (aquatic, terrestrial, and human) and identifies where overlaps and conflicts occur so that the analysis team can discover opportunities and resource constraints in the watershed.

Synthesis was conducted by having each resource area report on areas of concern and findings that had been identified through the assessment. These concerns and findings were then displayed on a working map so that overlaps, interactions, and potential conflicts could be identified and discussed as a group. This chapter lists the major findings by resource area by domain and then presents the synthesized recommendations developed by assessing identified opportunities in light of resource constraints and management goals for the analysis area.

Aquatic Ecosystem Findings

Aquatic Habitat and Fish Species

Findings

- Six species of salmon/char use the low gradient tributaries and mainstem of the White Chuck River. Chinook salmon and bull trout are federally listed Threatened species. Coho salmon and coastal cutthroat are Forest Service Sensitive species.
- One indicator in the U.S. Fish and Wildlife Service Matrix of Diagnostics/Pathways and Indicators, road density and location, is considered to be functioning at risk within the aquatic ecosystem. This corroborates the findings elsewhere in this watershed analysis that identify road concerns in the lower watershed.
- Historically fishless high elevation lakes have been stocked with both native and non-native fish species.
- Fish passage is generally acceptable, with the following exceptions. The Fish Passage Through Culverts inventory identified six culverts as passage barriers on tributaries to the White Chuck River. In addition, a culvert and two wooden bridges were identified by the Skagit System Cooperative and the Washington Department of Fish and Wildlife as partial barriers. The amount of habitat above these sites has not been verified, but is estimated to total at least 1.75 miles, affecting bull trout, coho salmon and cutthroat trout. The culvert at Owl Creek has been replaced with a bridge.

- Stream temperatures may be limiting to bull trout in the mainstem White Chuck River, assuming revised Washington State Water Quality Standards correctly assess their requirements.
- Only five percent of the streams are actually two percent gradient or less. The best spawning and rearing fish habitat is in the low gradient streams. Less than seven miles of stream are two percent gradient or less and Stream Class 1 or 2.

Trends

- Watershed restoration is expected to be minimal with the exception of road stabilization and fish passage improvements. Fish management restrictions are in place.
- Natural turbidity will limit habitat quality.

Needs and Opportunities

- Validate amount and quality of fish habitat upstream of culverts identified as fish barriers and assign priority for replacement. Also consider downstream impacts to fish habitat for non-barrier culverts needing replacement.
- Determine relationship of White Chuck chinook to upper Sauk or Suiattle stocks.
- Determine the life history forms of bull trout in the watershed and habitat limitations in the watershed.
- Collect mainstem aquatic habitat information and develop watershed-specific target habitat conditions.

Water Quality, Hillslope Processes, and Hydrology

Findings

- Glacial till and interbedded glacial lacustrine materials (existing primarily within the lower valley floor) develop unique soil structural and textural characteristics that can have a substantial influence on slope stability potential by influencing soil drainage characteristics. Some “side-slipping” fault zones could redirect stream channels, causing road failure and severe erosion or mass wasting of hillslopes.
- The MBS Slope Stability Model predicts 22 percent of the analysis area as highly unstable. The main areas are in the lower subwatershed (171100060105). The characteristic position of these unstable soils is in deep glacial till on the lower hillslopes and mudflow (lahar) deposits that cover the major valleys. The two land areas with the highest percentage of high mass wasting potential are DM and CM:

DM (deep glacial till and mudflow deposits on the valley bottoms): 65 percent of the DM soils are considered high risk.

CM (deep soils on steep toe slopes and mid slopes): 44 percent of the CM soils are considered high risk.

S8 soils (known to be prone to mass wasting, and included in the high risk category) were not mapped in the wilderness areas of the upper White Chuck drainage area. Therefore it is likely that additional S8 (high risk) soils actually exist, especially in the wilderness.

- An overlay of past timber harvest units and existing roads with high risk soils shows a high instance of unstable soils in managed areas. Proposed harvest areas also include areas of high risk soils.
- Recent glacial retreat has exposed large areas of bedrock in the upper White Chuck. Extensive rock outcrop and talus slopes (36 percent of the analysis area), a high proportion of steep slopes, and a high stream density result in rapid (flashy) runoff.
- A low amount of the prominent rain-on-snow zone and large area within the highland precipitation zone make this watershed less prone to rain-on-snow floods. The October 2003 flood was not a typical rain-on-snow event because a snow pack had not developed. The highland zone and glaciers contributed to the magnitude of the 2003 flood.
- The current vegetation disturbance for the entire analysis area is very low, at 1.5 percent. The highest disturbance levels were 30 percent and 28 percent from fires around 1668 and 1701, respectively. In recent times the vegetation disturbance level from timber harvest and roads peaked in 1954 at slightly greater than three percent.
- Valley mudflow deposits and steep side slopes have resulted in narrow channels with steep, unstable inner gorges. Floods and channel migration processes can cause inner gorge failures by eroding the toe slopes and destabilizing the entire slope. Side channels are also narrow and cause big gullies as they cross the mudflow area.
- High stream stemeratures may be influenced by the large number of small streams in non-forest types at higher elevations. There is little or no shade cover or large wood on the small streams in the alpine areas.
- Riparian areas were not harvested in most places because of lack of access (Crystal Creek and the lower White Chuck are the exceptions). This has retained relatively mature riparian communities along stream channels, although the dynamic nature of the channels constantly resets the vegetation on the streambanks. Mature trees are present for shade to maintain water temperature and a supply of large woody material.

- Where non-forest or shrub vegetation coincides with highly erosive soils, there is heightened concern for streambank erosion. There are approximately 18 miles of stream channel in the White Chuck where this situation occurs, mostly along Class 4, intermittent, streams in the upper watershed. However, there are areas along the lower White Chuck (Class 1 and 2 streams) where young vegetation and highly erosive soils coincide.
- Road failures are a concern. Unstable, steep slopes and avalanche chutes adjacent to roads increase the probability of debris plugging road drainage features and resulting in road failure. Washouts add to an already high sediment load and prevent or impair access. Road designs need to consider the steep avalanche chutes.
- Concentrating water from roads and harvesting could aggravate slides/failures. Hillslope failures generally have enough energy to pass through the riparian areas and enter the channel network.
- High recreation use at Boulder Basin includes avoidance of the toilet on the Sitkum Glacier climbing route. There is an unconfirmed concern about surface water contamination by fecal coliform bacteria. This same concern exists at heavily used lakes.

Trends

- Increased recreation use in the White Chuck will increase the potential for more overuse at popular sites in riparian areas. The potential for soil compaction, dumping of trash, improper disposal of wastes and the resulting water quality impacts will increase.
- Funding for road maintenance is not expected to increase and will likely decrease. Reductions in road maintenance will accelerate road surface erosion and the potential for cut and fillslope erosion and slope failure (landslide).

Needs and Opportunities

- Mapping of J8 and S8 soils in the upper White Chuck.
- Determine the level of contamination by human waste at high use sites.
- Assess impacts to riparian and stream habitats associated with recreational use.
- Evaluate the effects on wetlands and potential for erosion from compaction at high use sites.
- Determine if stream temperatures are the result of management effects or natural conditions.

- The broad floodplain in the lower White Chuck River provides an opportunity to take steps to develop a conifer stand to enhance the riparian area.

Terrestrial Ecosystem Findings

Vegetation

Findings

- Six vegetation zones are represented in the analysis area, which is more than most watersheds on the Forest. This diversity reflects the great vertical relief in the watershed and the rain shadow effects of Pugh, Spring, Red, and Black mountains along the south edge of the watershed. The vegetation zones include subalpine fir, which typically occurs in drier areas, such as the south end of the forest.
- The high diversity of plant communities is also reflected in a wide array of Plant Association Groups (PAGs) with nearly one third of the PAGs being non-forest types.
- There are at least 45 known Survey and Manage (S&M) plant populations in the watershed, and 3 Sensitive species. Some of the sensitive plant species in the White Chuck represent the only sightings of these species on the Forest or Darrington District. The high number of S&M and Sensitive plant sightings is unusual for such a small watershed, but this may reflect the greater area of the White Chuck that has been surveyed than other watersheds across the Forest.
- Natural Range of Variability (NRV): The three vegetation zones are within or close to the historical NRV. In some vegetation zones it appears that there is little older vegetation, when there actually is. The mid-seral age-class range for silver fir and mountain hemlock is wide and includes 300-year old trees.
- The Western Hemlock Zone is where recent timber harvest occurred. Future harvest planning should consider the seral stage distribution of this zone.
- Two species of noxious weeds are known in the watershed: Orange hawkweed along the main White Chuck Road 23, and knotweed at the end of spur 2200013.
- Three major periods of fire disturbance have been documented, displaying a 300-350 year cycle. Fires were approximately 5,000 acres in size, with smaller re-burns occurring approximately 30 years after each large occurrence. The last major fire disturbance was in the early 1700s, so the watershed is theoretically due for a large fire.

- There is no fire management plan for the Glacier Peak Wilderness. The District actively suppresses fires in the wilderness.
- Other disturbances such as wind, insects, and disease, have not been major factors or concerns. There are several types of insects attacking blowdown but activity is low. Mistletoe is most widespread of diseases.

Trends

- The potential for a fire disturbance is increasing.
- Future timber harvest in the Western Hemlock Zone could cause vegetation seral stages to be outside the historic Range of Natural Variability.

Needs and Opportunities

- A fire management plan for Glacier Peak Wilderness would provide direction for the use of fire for specified resource benefits and minimum impact suppression tactics.
- Interest in Forest Health Issues provides an opportunity to update Forest Fire Plans. The west side of the North Cascades with longer fire frequencies will remain a lower priority than the east side of the Cascades from a Regional perspective in funding forest health issues.
- Identify noxious weed sites in the watershed in order to develop a comprehensive plan for control/elimination.

Wildlife

Findings

- Stand Year of Origin maps show a predominance of mature and old growth habitats in the drainage. This provides large areas of suitable interior forest habitat for spotted owls, pine marten, and woodpeckers.
- Murrelets are an issue in the lower portion of the drainage where the White Chuck is located less than 40-miles from salt water (Zone I). Zone I encompasses approximately twenty percent of the drainage. The lower White Chuck is the area of known murrelet activity, but surveys are limited so the extent of murrelet use of the drainage is unknown. The lower watershed is also where there is the possibility of timber management activities and impacts to nesting habitat. The portion of the watershed beyond 40 miles (Zone II) is approximately eighty percent of the drainage, and is less likely to have concentrated murrelet use.

- Glacier Peak Wilderness, which is part of the North Cascades Grizzly Bear Recovery Area, contributes large blocks of security habitat to the Suiattle Bear Management Unit (BMU). High volumes of human use and having human food accessible to bears increase the potential for bears and humans to conflict.
- The high mountain peaks offer unique island habitats, including high quality mountain goat habitat. Human presence, such as hiking and climbing, could displace mountain goats, especially on the smaller peaks. In some locations human urine may be an attraction for goats seeking salt traces left from urine.
- Glaciers, avalanche chutes and varying vegetation fragment habitat in the upper watershed. Fragmentation in the lower watershed is mostly by timber harvest and roads. The current level of habitat fragmentation provides diverse habitat for a variety of wildlife species.
- Connectivity of old growth habitat is high within the White Chuck and surrounding areas due to the extent of the Glacier Peak Wilderness and Late Successional Reserves in adjoining watersheds.
- Rat Trap Pass is one of the natural travel corridors for species moving between the Suiattle River and White Chuck River drainages, and between White Chuck Mountain and the ridge system leading to Glacier Peak.
- Species suspected of being most influenced by human use in the White Chuck are those that are or were hunted or trapped in the recent past: bear, deer, cougar, bobcat, beaver, marten, fisher, coyote, grouse, band-tailed pigeon, wolf and mountain goat. Other species that were impacted by human uses are those that are most associated with harvest of lowland older forests such as the spotted owl and marbled murrelet.
- Most human influences on the wildlife occur seasonally along roads and trails. Road 23 and the major trails it accesses are used heavily from May through October. Fall hunting and winter cross country skiing and snowmobiling occur during the colder months. Road 27 is less heavily used than the White Chuck Road 23.
- Most human influences on the physical habitat have been in the lower portion of the drainage in the form of timber management. Since the 1980's there have been no clear-cut harvests, with many plantations maturing to provide dispersal and cover habitat.
- The limiting factors for northern spotted owls include; a limited prey base, increasing competition from barred owls, and limited suitable nesting habitat at lower elevations. The watershed is also located at the northern edge of the spotted owl range.

Trends

- Over time, there will be an increasing amount of mature and older forests, and interior forest areas.
- Desire for recreation use within the White Chuck drainage will continue to increase with the increase of population in the Puget Sound area, and the attractiveness of the White Chuck area. This will result in management challenges to meet responsibilities to both wildlife use of habitat and recreational desires.
- Due to 2003 flood impacts to roads, trails, and bridges, human influence on wildlife in the White Chuck drainage is expected to be limited during 2004-2006, while the Forest assesses access needs and infrastructure repairs. This period of little human influence is expected to be followed by some period of road and trail repairs/reconstruction depending on the decisions for the proposed repairs.
- Floods will continue to provide adjustments in riparian vegetation, and recruitment of large woody material.
- Influences on wildlife from humans will decrease due to road and trail damage, but will increase after repairs and reconstruction projects are completed and use increases.

Needs and Opportunities

- Develop management actions to promote desired habitat conditions for species of concern.
- A coordinated management approach with recreation and fire management would improve opportunities to maintain and enhance foraging/denning/dispersal habitat for grizzly bear and gray wolf and providing better protections for mountain goat summer and winter range, kidding and dispersal areas.
- Use information from goat studies scheduled from 2002 to 2006 to update Forest Plan Management areas .

Human Use Findings

Timber Management and Special Forest Products

Findings

- A substantial portion of the watershed outside of wilderness is classified as Matrix land, which emphasizes timber management. Many timbered stands in the Matrix and riparian areas are over stocked with too many trees for maximum growth.

- Most of the historic harvesting occurred in the lower elevations, which are more accessible to railroad grades. More recent harvesting in the watershed has been completed with cable systems and hauling by log trucks over a system of logging roads. Some access roads to potential timber management areas are being closed or decommissioned and eliminated from the system.
- Most timber harvesting has occurred within the Western Hemlock Zone. The last timber harvesting occurred in the watershed about 1990.
- There are about 1000 acres of trees thirty years old or less. Of these acres, about 290 have been pre-commercially thinned in the recent past. There are another 1000 acres between the ages of 30 years and 40 years old. Stands of these ages may have trees too large for pre-commercial thinning and too small for commercial thinning. An additional 3000 acres are within the commercial thinning age (size) of 40 -80 years old.
- Special Forest Products (SFP) available in the watershed include moss, tree seedling transplants, mushrooms, Christmas trees, posts, firewood and conifer boughs, just to name a few. We do not know the real availability of Special Forest Products or what level of harvest is sustainable.
- Commercial permits are limited to some transplants, boughs and seed cones. Personal use permits cover most all Special Forest Products available. Illegal gathering and removal of Special Forest Products without a permit is a common occurrence.
- There is a true fir spacing study on top of Rat Trap Pass, conducted by the Pacific Northwest Research Station.

Trends

- Overstocked stands will continue to decline in growth, vigor and health, making them more susceptible to wind, insect, disease and fire disturbances.
- Road elimination continues to be implemented which will limit access for future management options.
- Demand for Special Forest Products will continue and will probably increase in the next few years. Demand for different products will also increase.
- Theft will continue and will increase as the value of products increase, more selling value on local markets results in more theft of products.

Needs and Opportunities

- Identify tree stands where maintaining tree growth and stand stability and health through silvicultural treatment is compatible with other resource concerns and constraints.

- There is a need to evaluate the current Special Forest Products program to determine what products are available and what level of removal is sustainable without causing resource damage.

Road Infrastructure

Findings

- Roads Analysis shows most roads off the White Chuck Road 23, and system roads 22, 24 and 27 as being of high need for access use and high concern for resources. There are approximately 29 miles of open road in the analysis area.
- The 2001 Fish Passage Through Culverts inventory found six fish passage barrier culverts in the White Chuck watershed. These culverts block fish access to small tributaries to the White Chuck River.
- There are some closed roads, and one stored (Level 1) in the Pugh Blend area.
- Road 23 washed out at least two times before October 2003, one time below the Crystal Creek Campground and the other at milepost 6.5. October 2003 washouts occurred at milepost 1.9, 2.4, and 3.5. Protective riprap was scoured from one approach to the bridge at M.P. 5.7. Recent floods have caused scour at the bridge site.
- Pugh Road 2311, high clearance (Maintenance level 2), has drivable waterbars. Need to improve the waterbars and maintain the culverts. A gravel pit is located at about milepost 2.5 on Road 2311, which needs to be accessed and there is a potential for timber harvesting that would utilize Road 2311.
- Black Oak Road 2440 is inaccessible, because the bridge is gone. A lack of maintenance on the roads beyond the bridge has resulted in culvert failures and road drainage problems from slides.
- Rat Trap Pass Road 27 is a unique pass road for the District. There are ongoing maintenance problems on Road 27 near Rat Trap Pass. The river is eroding the bank and it is slowly giving way. Raveling is active at about milepost 3.9 because of steep, unstable slopes. A log crib above the road held the lower segment of the road in place.
- Road 2710 (Meadow Mountain) is in poor condition. The road is barricaded, but not treated for storage and is used as a system trail.
- The Crystal Creek Road has severe problems with drainage. The Crystal Creek Road 2710011 has been closed and added to the trail system. The road was waterbarred, but not treated for conversion to a trail.

- The following updates need to be made in the Roads Analysis and Road INFRA databases:
 - Road 2088 has a High need for access for Matrix, so the objective level should be Level 1 instead of Decommission;
 - Road 2090 has a High need for access for Matrix;
 - Road 2200013 has a High need for access for Matrix and Recreation (trailhead at 0.3 miles);
 - Road 2436036 should have an objective Level 1 and not Decommission since it has a High need for access for Matrix; and
 - Road 27 has a High need for access for Matrix.

Trends

- With current maintenance, road drainage failures will increase and slope failures and slides will increase which will increase sediment delivery to the stream network.
- Funding for road maintenance will probably continue to decrease.

Needs and Opportunities

- An ATM with particular attention to management needs for Road 2710. This analysis should take into consideration the use of the road for timber, fire, and trails. Road 2710 shows as a “Level 3” road, but it is barricaded and in a state of deterioration (unacceptable Level 1).
- Need to restore access to Road 2440 system and perform maintenance and drainage repairs.

Communities

Findings

- Timber harvest reduction on National Forest lands has directly affected the economy and businesses in Darrington. Hampton Mill, having bought Summit Timber Company, obtains most of its timber from state and private lands.
- An increasing recreational presence generates income to the town from the people passing through.
- No known mining claims are present. There was an active pumice mine at the beginning of Road 23 at one time.

Trends

- Darrington will continue to try to increase tourism revenue to diversify the economy.
- Increasing recreation use in the area will increase traffic by recreationists to and through Darrington.
- Hampton will continue to need small logs for its mill.

Needs and Opportunities

- More effectively utilize partnerships with local and county tourism efforts.
- Identify opportunities for small log sales

Recreation

Findings

Trails

- The extensive trail system (62.5 miles) is difficult to maintain because of topographic steepness, numerous stream and river crossings, high precipitation and unstable soils. Several sections of the White Chuck trail between Fire Creek and Kennedy Creek were lost from landslides or debris flows during the October 2003 flood.
- Timber sales and road construction have obliterated large portions of the Meadow Mtn. and Crystal Lake Trails and severed the trail connection between the White Chuck and Suiattle Rivers. Five miles of the Meadow Mountain trail are currently located on a closed road. The first 2.5 miles of the Crystal Lake Trail are on an abandoned timber sale road, landing, and fire line, which have extensive drainage problems.
- The MBS Forest Plan proposed to construct trails to Thorton Lake (1.5 miles), White Chuck Mtn. (1.0), and to extend the White Chuck Trail 6.0 miles to connect with the White Chuck Bench Trail. Other trails scheduled for reconstruction in the MBS Forest Plan include Meadow Mtn., Lost Creek Ridge, and Crystal Lake. Another 14.5 miles or more of trail will need reconstruction within the next ten years. Those trails include Kennedy Ridge, Lake Byrne, Boulder Basin, and portions of the Pacific Crest Trail. These projects will be delayed until the flood repairs are complete.

- River erosion on toe slopes has caused washouts of several sections of the White Chuck Trail. Trail reroutes have been constructed several times around the washouts with additional switchbacks. The October 2003 floods caused numerous washouts along the trail, making the five-mile trail completely impassable. Due to the extent of the damage, it is likely the entire trail will need to be relocated. The floods damaged or destroyed numerous trail improvements implemented in the last decade as well as washing away numerous bridges.

Wilderness

- Congressionally designated wilderness makes up seventy-one percent of the analysis area. The Glacier Peak Wilderness is mapped as Transition Zone in the Recreation Opportunity Spectrum (ROS).
- The White Chuck Trail is within the Transition/Trailed Zone in the Wilderness Recreation Opportunity Spectrum (WROS) and is considered within the Limits of Acceptable Change.
- Primary wilderness use was at Kennedy Hot Springs, the Pacific Crest Trail and climbing routes to Glacier Peak. Use begins in spring and steadily increases, as upper elevations become snow free. Flooding in October 2003 reduced access to Glacier Peak and the Pacific Crest Trail. In addition, the Kennedy Hot Springs area was buried. It will be a number of years before trails are repaired and use returns to what it was. Use may not return to Kennedy Hot Springs.
- Campfires are prohibited at Lake Byrne, by special order issued in 1988, in an attempt to reduce trash accumulation and damage to living trees. Some revegetation of denuded sites was done in the 1980s and 1990s.
- Human waste was and will be a problem at Boulder Basin after access is repaired. Climbers using the Sitkum route don't use or can't find the toilet there. There is a concern for contamination of the water source upstream from where people fill up their water bottles.
- Human/bear encounters in the Kennedy Hot Springs area prompted the installation of cables for hanging food.
- Five land-based guides operate in the White Chuck drainage, providing climbing and backpacking trips. They will not be operating in this area for the next few years and will be displaced to other districts and forests.
- There is a moratorium on issuing new outfitter and guide permits on Glacier Peak. Outfitters that are climbing Mt. Baker can request to deduct their day usage on Mt. Baker for use on Glacier Peak instead.
- A seismograph is located on Glacier Peak to monitor volcanic action and provide early warning of potential cataclysmic events.

Dispersed Use

- Since there are no pay campgrounds, and most of the White Chuck campground was washed out in the 1990s flood events, the White Chuck watershed is a dispersed use area. There are many dispersed campsites in riparian areas. Problems with these sites include garbage, transients, firearm shooting, and drug operations.
- Recreational uses in the analysis area include lake fishing, hunting, berry picking, mushrooming, cross-country skiing, scenic driving, camping, hiking, climbing, backpacking, and horseback riding.
- The White Chuck River is a recommended Wild and Scenic Recreation River and eligibility needs to be maintained. The lower part of the White Chuck is designated scenic Viewshed (foreground and middle ground, with semi-primitive non-motorized).

Trends

- The Forest trail budget continues to decline while other revenue sources for trails, such as the Northwest Forest Pass, state, federal, and private grants, seem to be increasing. The existing level of trail maintenance is expected to continue. The current trail system is not adequate to meet future recreational needs. Meadow Mountain, in particular, is an example of a trail that does not meet trail system standards.
- The October 2003 floods will require expensive bridge replacements and additional trail relocation and reconstruction. This work may delay other planned reconstruction projects.
- Demand for recreation on National Forest System lands is expected to increase. The White Chuck Trail is a major portal to the Pacific Crest Trail, Glacier Peak, and other hikes. Use will be displaced to other areas until trail repairs are completed.
- Wilderness use will continue to present challenges to protect resources while providing for increased demand due to decreasing funds for wilderness management. There will be an increase in the need for use of helicopter for trail repairs, search and rescues, and fire.

Needs and Opportunities

- Additional personnel are needed for public education about degradation problems and monitoring of resource conditions and illegal uses.
- An assessment on the amount of use in the Glacier Peak wilderness is needed. This assessment should include a recommendation of the level of trail maintenance that could be sustained for maintaining the experience and an outfitter guide and resource needs analysis to determine the extent of further commercial permitting in the area.

- Hiker and stock user experience could be improved by rerouting trails away from the Meadow Mountain and Crystal Creek roads and reconnecting the White Chuck and Suiattle River drainages. Need to analyze impacts on grizzly bears from increased human presence.
- The Forest Plan proposes an extension on the White Chuck Trail, which would connect it to the White Chuck Bench Trail. The area south of the White Chuck River has no human presence now so wildlife may be impacted by a trail there while a route north of Road 23 would be through harvest units and have less impact on wildlife. The feasibility of developing this trail needs to be determined, considering the effects of the 2003 flood and resource concerns, including the crossing of wetlands, debris fans, and avalanche chutes.

Heritage

Findings

- There was ancestral use by the Sauk-Suiattle Tribe for fishing, berry picking, and goat hunting.
- The Kennedy Guard Station, constructed in 1924, was eligible for the National Register of Historic Places, but was destroyed in the October 2003 flood event.
- The Sauk River Lumber Company Historic District (railroad logging) occurs near the mouth of the White Chuck River but in the Sauk watershed.

Trends

- Historic sites will continue to deteriorate over time and little monitoring will occur due to lack of funding.

Needs and Opportunity

- Monitoring information is needed on inventoried sites.

Synthesis and Recommendations

Team members were asked to identify areas of use and resource concern within the White Chuck watershed. Figure 1 Aquatic Areas of Concern, Figure 2 Terrestrial Areas of Concern, and

Figure 3 Human Dimension Areas of Concern show generalized areas of the main resource uses or concerns. They do not capture all of the concerns and findings of the analysis. These generalized lines are not for specific management use without on-site validation of the conditions represented by the polygons. These maps and the synthesis of the findings led to the development of recommendations.

The greatest challenge to management of resources in the White Chuck watershed is meeting the level of need with reducing budgets. Increases in recreation demand will require a clear strategy for managing appropriate recreation opportunities and constraining inappropriate use. Concerns in the wilderness and upper portions of the drainage include increased use, trail construction, reconstruction, and maintenance, wildlife habitat, administrative presence, human waste disposal, and education. Other concerns in the lower portions of White Chuck include dispersed camping, road stability and maintenance, noxious weeds, fisheries, slope stability/soil productivity, and law enforcement (drugs, garbage, transients).

The MBS Forest Plan proposed a number of use increases and improvements. Some improvements were implemented and others have not due to budget constraints. The October 2003 floods destroyed a number of improvements.

Maintenance of the road and trail system must occur even under a custodial management scenario. Additional resource damage will occur without active maintenance of facilities. Active management of the use is also needed to prevent deterioration of resources and the recreation experience. The following recommendations are offered based on the needs of the resources in the watershed; finding the financial means to implement the recommendations will be a challenge.

Aquatic Ecosystem

Aquatic Habitat and Fish

The interaction between the aquatic environment and the highly erodible landscape plays out in steep stream channels with limited habitat. The lower reaches of the White Chuck hold the most potential habitat, but the high sediment load produces rather mobile gravel bars, and as was the case during the October 2003 floods, a dynamic channel that may erode banks and shift large distances. Glacial meltwater produces turbid water during the summer months. However, anadromous and resident fish have evolved to survive in this environment. Fish information is relatively limited for the White Chuck. Fish use in the mainstem is probably limited by the high turbidity of the glacially-derived runoff, especially during summer. Roads pose the greatest management concern.

The White Chuck River transports much of the sediment generated in the watershed directly into the Sauk River. If greater than normal sediment is generated in the White Chuck, this contributes to a greater than natural load in the Sauk River and may contribute to channel instability in the Sauk River.

The literature documents negative impacts to natural ecosystems from lake stocking of fishless lakes or with non-native fish. The type and extent of the effect on native fish and amphibians at the lakes is not known.

Recommendations

- Field validate fish passage and habitat information relating to barriers identified in the Fish Passage Through Culverts inventory and the Skagit System Cooperative and Washington Department of Fish and Wildlife inventory. Fix passage problems as prioritized.
- Collect water temperatures in streams that may be used by bull trout to determine if management activities are influencing this habitat attribute.
- Continue working with the Washington Department of Fish and Wildlife to eliminate non-native fish stocking programs in high lakes and to reduce impacts at heavily used lakes.
- Continue stabilizing roads to eliminate elevated levels of sediment from entering the stream network. Decommission roads no longer needed.
- Develop a close partnership between fisheries and recreation to implement a public education and awareness program concerning overuse impacts in the wilderness and at dispersed camping sites along the river.

Water Quality, Hillslope Processes, and Hydrology

Erosion and mass wasting are a major concern with regard to roads. While there is a relatively low density of roads in the watershed, most roads are located on unstable slopes, cross avalanche paths, and do not receive adequate maintenance. Closed roads that are merely blocked, have not been adequately treated to be self-maintaining in light of landslides, water erosion, and plugged culverts and ditches (Crystal Creek and Meadow Mountain roads are examples). Road erosion and mass failures travel through the Riparian Reserves and deliver sediment to the channels and exacerbate an already high sediment load in the White Chuck mainstem. In return, stream channel erosion can cause failure of mudflow terraces crossed by roads. Channel erosion during the October 2003 floods caused channel migrations in the lower watershed that proved how volatile the floodplain is for roads as well.

Many of the roads in the White Chuck do not meet the definition of “stabilized” as defined by WAC 222 and thus do not meet Clean Water Act requirements. Summer stream temperatures do not meet proposed State Water Quality Standards for bull trout.

Unstable soils, as predicted using the MBS Mass Wasting Potential model, are common in the watershed. Recognition of these soils and taking appropriate measures to avoid or mitigate for them will minimize road and trail maintenance and help protect water quality and fish habitat.

Recommendations

- Determine what is causing the high stream temperatures in the White Chuck (naturally exposed channels, geothermal inflow, riparian harvest, road and other management related sediment effects) through additional monitoring.
- Develop a strategy to stabilize roads to meet requirements of the MOA with the Department of Ecology. Use Roads Analysis and ATM to prioritize roads for upgrading and decommissioning.
- Validate high-risk soils during project development. Keep roads out of inner gorge locations when possible. When opportunities arise, relocate roads away from unstable soils and the top of inner gorges.
- Include the White Chuck River dispersed sites and high use wilderness lakes in the Forest strategy for managing recreation in riparian areas.

Terrestrial Ecosystem

The White Chuck River watershed provides an abundance of quality and unique habitats, especially for wildlife and plant species of concern.

Vegetation

Natural disturbances, such as fire, are key to maintaining the distribution of seral stages in the analysis area. The current distribution is within the Range of Natural Variability (RNV). Timber harvest has affected disturbance within the western hemlock zone, but not to the point of moving that vegetation zone outside of the RNV. Most of the effect of logging has been the conversion of the river flats and benches in the lower watershed to primarily hardwoods. The distribution of forest types and seral stages in the White Chuck is most influenced by fire and elevation. The large amount of older forest results from a naturally long interval between fires. Currently there is no fire management plan for the area.

Noxious weeds are present in the watershed and a concern for spread. Knotweed could have come in by garbage or yard waste dumped along roads. Noxious weed spread could occur by vehicle and possibly through stock use of trails. A forest wide noxious weed EA is addressing the problem and treatment of the weeds.

Recommendation

- Complete a fire management plan for Glacier Peak Wilderness, which would include use of fire for specified resource benefits and minimum impact suppression tactics.
- Prioritize and treat noxious weed infestations.

Wildlife

Older forests cover much of the watershed. Interactions between recreation users and wildlife are increasing and may displace certain species. High levels of human use, and improper disposal of trash and human waste may result in negative interactions between wildlife and recreationists. Areas that are most sensitive to human/wildlife interactions are areas, such as the alpine meadows, rivers, climbing routes and high mountain lakes.

Maintaining options for grizzly bear recovery is a large responsibility for managers in the North Cascades and within the White Chuck drainage. Current management for security habitat is for “no net loss of core habitat”. This means that an increase of trail use from “low”(<15 parties week) to high trail used (more than 15 parties per week) would be considered a reduction in security acres, and increase use would need a corresponding decrease in trail or road use/access within the same bear management unit to result in “no net loss of core habitat”.

Trail proposals, such as White Chuck, Lost Creek Ridge, or Thornton Lake Trails may grizzly bear core habitat, and impact mountain goats by increasing human presence in areas where goats had been hunted and may flee from human presence. These animals have limited areas for summer range.

The upper portion of the watershed is largely designated as wilderness. Potential of recovery and maintenance of Threatened and Endangered species and their habitat (specifically northern spotted owl) is dependant upon overall distribution of the owl within and beyond the analysis area. The LSOG (older forests) located at Rat Trap Pass provides connectivity of older forests, from the Suiattle drainage to the White Chuck wilderness area. The White Chuck drainage connects older forest habitat in the adjacent watersheds of the Suiattle and upper Sauk drainages.

Recommendation

- Review overall grizzly bear and mountain goat habitats and assess the probable current effects on habitat and animal use. Analyze the effects of increased hiker and automobile use on grizzly bear and mountain goat security habitat for all projects.
- Monitor species of concern for presence in relation to management actions to promote desired habitat conditions

- Explore opportunities along the White Chuck River and Crystal Creek to enhance spotted owl and marbled murrelet habitat using vegetation management strategies that may include adjustments of species mix, stand density, or stocking levels.
- Work with recreation and fire management on strategies to enhance berry fields with burns, especially in the historic grizzly bear and gray wolf use areas of Meadow Mountain, Pugh, and portions of Glacier Peak Wilderness.
- Coordinate management activities in areas with mountain climbing, snow mobile and other recreational uses, especially White Chuck Mountain, Pugh and Spring Mountains (or areas defined by the ongoing goat studies) to protect and enhance mountain goat habitat in summer and winter range, kidding and dispersal areas.
- Bald eagle use of fish resources at the confluences of the White Chuck and the Sauk Rivers, and harlequin duck use along the White Chuck River and its tributaries demonstrate their importance for maintaining and enhancing the breeding/nesting/rearing habitat for species associated with the fast-flowing rivers. Coordinate recreational activities, such as river rafting and campsite locations, to minimize impacts to habitat and species uses of habitat.
- Maintain and enhance habitat for Forest Management Indicator Species within the limits of the MBS Forest Plan designations. This may include management of matrix areas to include considerations for deer forage, snag densities, down wood, and special habitat.

Human Uses

The Forest Service is the largest provider of recreation in the local area, when compared to the Washington Department of Natural Resources and National Park Service.

Timber Management and Special Forest Products

Several areas in the watershed have potential for timber management. These areas include the east side of Black Oak Creek, White Chuck Bench, Meadow Mountain/Crystal Creek, and an unroaded bench between Camp Creek and the White Chuck River. Much of the timber can be accessed from existing roads, but several sites will require road construction or helicopter access. Road construction will require careful consideration of the slope conditions and drainage design and potential impacts to recreation and other resources. Areas without roads contribute to the security and connectivity of habitats.

There are potential timber sale areas that could be accessed on the Meadow Mountain and Crystal Creek roads. These would be first-entry sales of older trees, in matrix, outside of any roadless area. There are still questions whether these roads will be retained, used as trails, or decommissioned. Preliminary assessments of timber sale viability would look at mass wasting concerns. The MBS Slope Stability model used in this watershed analysis shows several areas of high mass wasting hazard that would need to be checked in the field, including an assessment of effects of past harvest in the vicinity on slope failures. The viability of the timber sale would also affect the future road maintenance needs for the roads.

Proposed timber harvest in Black Oak area (Parallel Timber) could damage or change the White Chuck Bench Trail. The Road 2440 system could provide access to harvest areas requiring reconstruction of the Black Oak Road Bridge and temporary road construction. There are concerns for impacts to goats and grizzly bear security areas. The 2440 road system has a high risk rating for failure. This potential timber sale area is within a scenic Viewshed, contains an historic owl location, and has heritage sites.

Proposed harvest in the Mt. Pugh area (White Chuck Sale) would utilize Roads 2311000, 2311011, and 2314. Management opportunities in this area include pre-commercial thinning and timber management in the remnant areas of old growth forest. There may be alder conversion opportunities in river valley and riparian areas that may help meet aquatic objectives. Road 2311 has a high instability risk and the last two miles affect mountain goat habitat. There is an opportunity for special forest products, potential scenic views, and Road 2311011 has active rock pit that is needed into the future.

There are pre-commercial management opportunities that would be accessed from the Road 2436 spurs, even though most of that road system is outside of analysis area.

Recommendations

- The analysis team recommends examining the potential for timber harvest in the White Chuck now, rather than putting it off to the planning phase of the potential harvest. This pre-examination of the landslide and soil erosion problems, wildlife and other resource concerns and opportunities could help determine the viability of the planned harvest, and facilitate making road and trail management decisions.
- Conduct an inventory of the availability of special forest products. Assess the sustainability of these products under a utilization program. Propose a program to offer these products.
- Inventory and prioritize stands for pre-commercial (30 years or less in age) and commercial (40 to 80 years old) thinning.

Road Infrastructure

Road maintenance is not adequate for many of the roads. While major failures have not occurred due to lack of maintenance, the hazards are increasing. The main roads are used mostly for access to trailheads and recreational driving and are in fairly good condition, even with a lack of maintenance. The exception is Road 27 over Rat Trap Pass. Road 27 is located on steep, unstable slopes with considerable cutslope ravel and unstable fillslopes. The drainage ditches fill with ravel and force water across the road, resulting in fillslope failures. The steep slopes deliver sediment directly to the stream system. Side roads receive less maintenance than the main roads and have similar drainage problems. Road 27 continues to have drainage and stability problems and has a high risk for failures. The risks are greatest in the Rat Trap Pass area.

Rat Trap Pass is a major corridor for wildlife movement and also the route for loop driving between the White Chuck and Suiattle Rivers. Dispersed camping along the Rat Trap road heightens the concern for the displacement of wildlife through use of that area. The flood of October 2003 washed out access to the Rat Trap Pass on both ends, at the Suiattle Boundary Bridge Road 25 on the north end and on the White Chuck Road 23. Repairs at the flood damage sites have been proposed and are being analyzed.

Some roads, Meadow Mountain and Crystal Creek in particular, have been closed but not adequately treated to be self-maintaining. Side cast construction was likely used, considering its age. Fill failures are likely. Repair and continued maintenance of the roads would be costly. Funding for such repairs is not likely to be available in the future, because of decreasing road maintenance funding and other priorities for road maintenance.

White Chuck Road 23 is in fairly good condition except for several sections that were damaged during the October 2003 flood event. In the past the White Chuck River has damaged the road repeatedly and the risk of future problems is high. The road is located on the lower floodplain and on the high mudflow terraces and is subject to damage from channel erosion and migration. An earlier analysis for repair of Road 23 considered closing the road and build trail to the existing trailhead. The decision was to maintain the road access to Owl Creek and the current White Chuck Trailhead.

Two roads, West Pugh (2090000) and White Chuck Pit (2200013) were identified through roads analysis as priority for closure/decommissioning. All other roads were identified as high need for vehicle use with high or moderate resource concerns. This means most of the roads in the White Chuck have a high risk to resources, and need to receive maintenance and/or reconstruction to reduce those risks.

Recommendations

- Validate roads analysis findings and general management strategies through a more local access and travel management assessment. Look at the timber harvest potential now, rather than later, to determine the type of treatments needed for roads.
- Use Roads Analysis and other road information to identify roads that can be decommissioned or put in storage to reduce the amount of annual road maintenance needed. Make the following updates in the databases:
 - Road 2088 has a High need for access for Matrix, so the objective level should be Level 1 instead of Decommission;
 - Road 2090 has a High need for access for Matrix;
 - Road 2200013 has a High need for access for Matrix and Recreation (trailhead at 0.3 miles);
 - Road 2436036 should have an objective Level 1 and not Decommission since it has a High need for access for Matrix; and
 - Road 27 has a High need for access for Matrix.
- Complete needed drainage treatment to Meadow Mountain and Crystal Creek roads after access needs are analyzed.
- Validate and prioritize fish passage problems at roads. Fix problems where needed.

Trails

The White Chuck trail is a major route to the Pacific Crest Trail, Glacier Peak climbing routes, several loop hikes. It is unique because it is close to Seattle. The current trail system does not meet current or future recreational demands and expectations. Extensive repair and/or relocation of the trail is needed.

Encounters between humans and wildlife are increasing and have the potential to displace some wildlife species. Of most concern is the effect of hikers/climbers on mountain goats, especially on the smaller peaks where security/escape areas are limited. High use levels around high elevation lakes are impacting plant communities, and potentially amphibian populations that depend on the lake-adjacent wetlands and riparian areas.

It is desirable to move/reroute the Crystal Creek and Meadow Mountain trails off the roads. Maintaining the roads as trails is very expensive and difficult. The road drainage is still in place and the full road prism must be maintained to keep the drainage structures properly functioning. Meadow Mountain Trail is currently accessible to stock and is designated as such. Crystal Creek Trail is not a stock trail, and not planned to be changed. Rat Trap Pass has a potential alternative trailhead location to the current Meadow Mountain Trailhead. Both trailhead and trail relocations have concerns relative to grizzly bear security areas.

Recommendations

- Repair and/or relocate the trails damaged during the October 2003 flood event. Analyze feasibility of relocating White Chuck Trail to more stable slopes.
- Assess possible Crystal Creek and Meadow Mountain trail and trailhead relocations in light of resource concerns and seek partnerships to work on adequate funding. Include an assessment of the potential to use the roads, currently used as the trails, for timber harvest or fire access so appropriate actions can be taken for the roads at the same time
- Review the MBS Forest Plan additional trail construction in regard to grizzly bear and mountain goat impacts.
- Increasing use on low use trails to more than 15 parties per week could reduce wildlife security acres and should be analyzed during the planning phase of any trail project.
- Proposed reconstruction of the Lost Creek Ridge Trail may impact mountain goat habitat and grizzly bear security habitat, which should be analyzed during project analysis.

Wilderness

Wilderness use is growing. Glacier Peak climbing, trail hiking and camping at high elevation lakes, especially Lake Byrne, are creating resource impacts from denuded vegetation and human waste. There are also concerns about the effects of increased use on mountain goats and sensitive plant habitat.

Glacier Peak has several routes that can provide for solitude. Overuse can detract from the sense of isolation and solitude. This will remain a challenge for management of the Glacier Peak area. Outfitter guides are limited to certain days to allow for the general public to have a quieter experience.

The October 2003 floods destroyed or damaged a significant amount of trail and trail bridges and buried the Kennedy Hot Springs site, including the springs themselves. Any proposed restoration of the popular Kennedy Hot Springs site should include an overall assessment of recreation opportunities and abilities of the Forest to manage and maintain.

People often times are not discarding waste properly and leave human feces exposed rather than buried or carried out. There is also a problem with the waste being transported in “blue bags” and then dumped into outhouses, which shortens the use of the outhouse by filling them up rapidly.

Recommendations

- Increase wilderness ranger presence for monitoring and education. There is an opportunity to reinforce and educate people on the proper disposal of human waste and garbage.
- Remove Kennedy Hot Springs Cabin from eligibility for the National Register of Historic Places as it was destroyed during the October 2003 flood event.
- Maintain campfire closure at Lake Byrne.
- Survey impacts to soils, plants and amphibians at high use sites. Develop restoration and protection strategies.

Dispersed Use

Dispersed camping is occurring in riparian areas along the spur roads off the White Chuck Road 23, with its accompanying problems. Education and law enforcement is needed for both public and employee safety. The White Chuck receives a small amount of dispersed camping use compared to other drainages on the district.

Ethnobotanical use includes berry picking and stripping cedar bark. Huckleberry fields are still important. There is some berry picking at Rat Trap Pass and Pugh Ridge. The extent of Native American use is unknown but is a consideration for management decisions.

Recommendations

- Develop barriers to keep dispersed site users from driving to the river and to control the spread of impacts.
- Consider implementing a public awareness program to reduce the inappropriate behaviors. Work with law enforcement to eliminate illegal activities.

Figure 1 Aquatic Areas of Concern

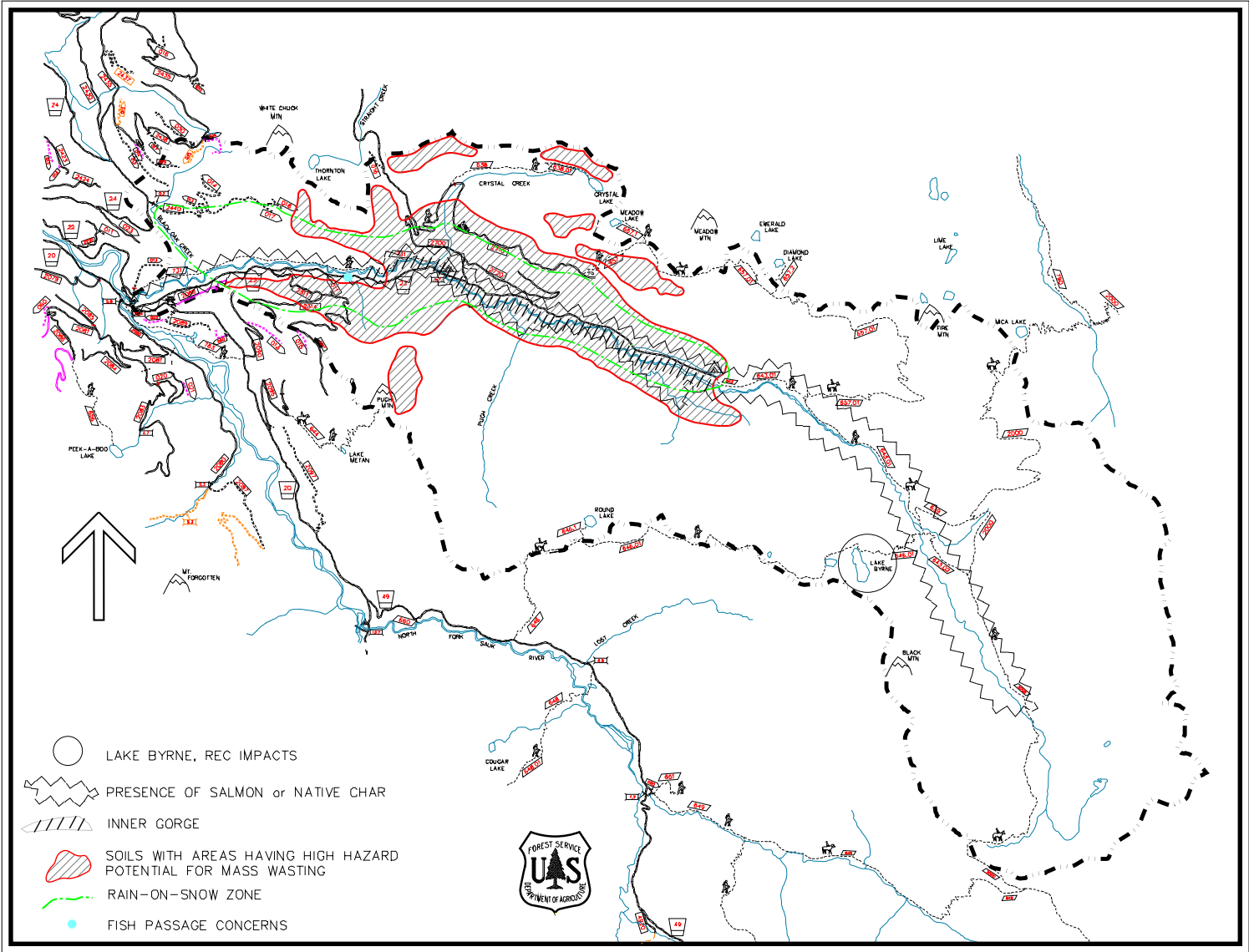


FIGURE 4-1

Figure 2 Terrestrial Areas of Concern

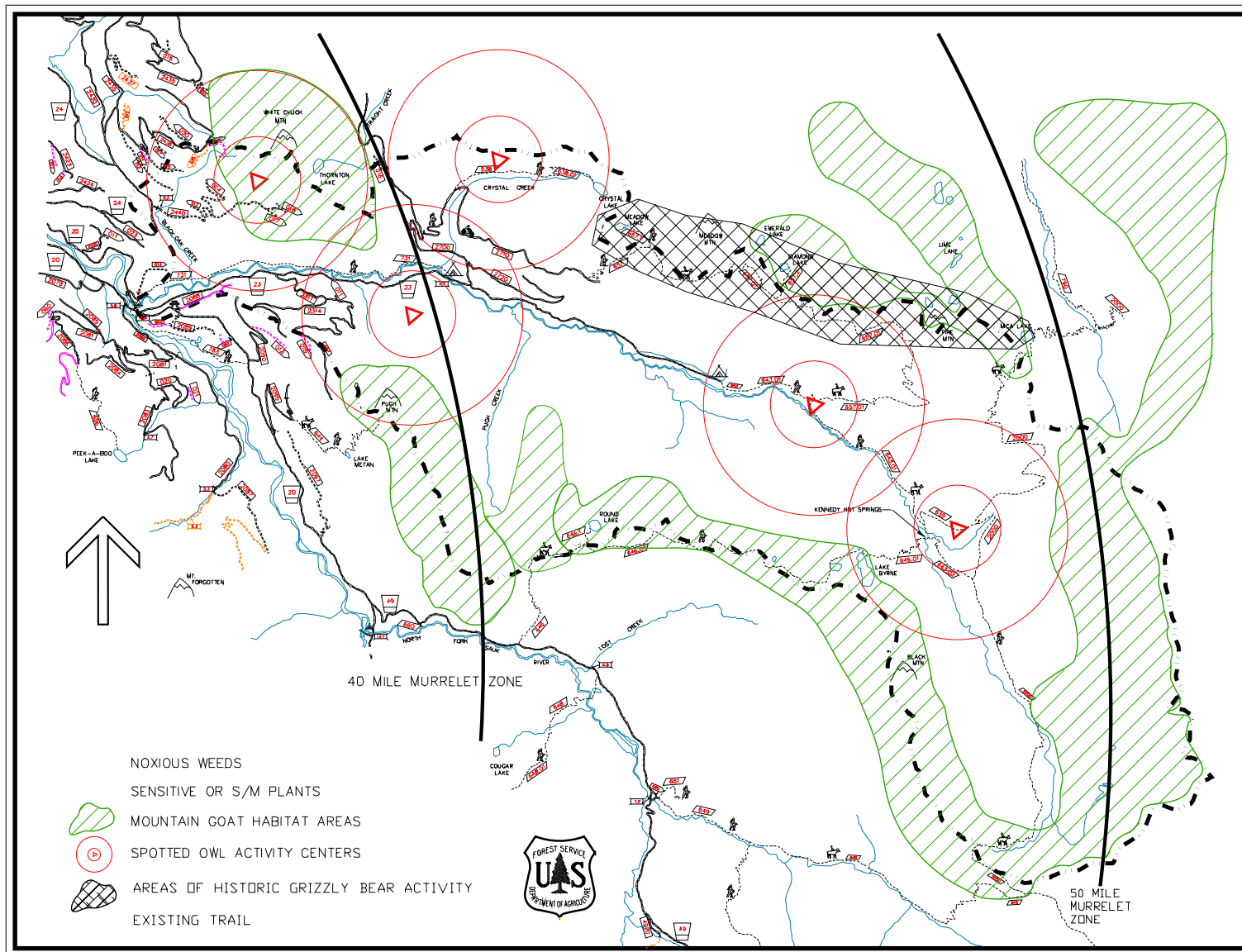


FIGURE 4-2

Figure 3 Human Dimension Areas of Concern

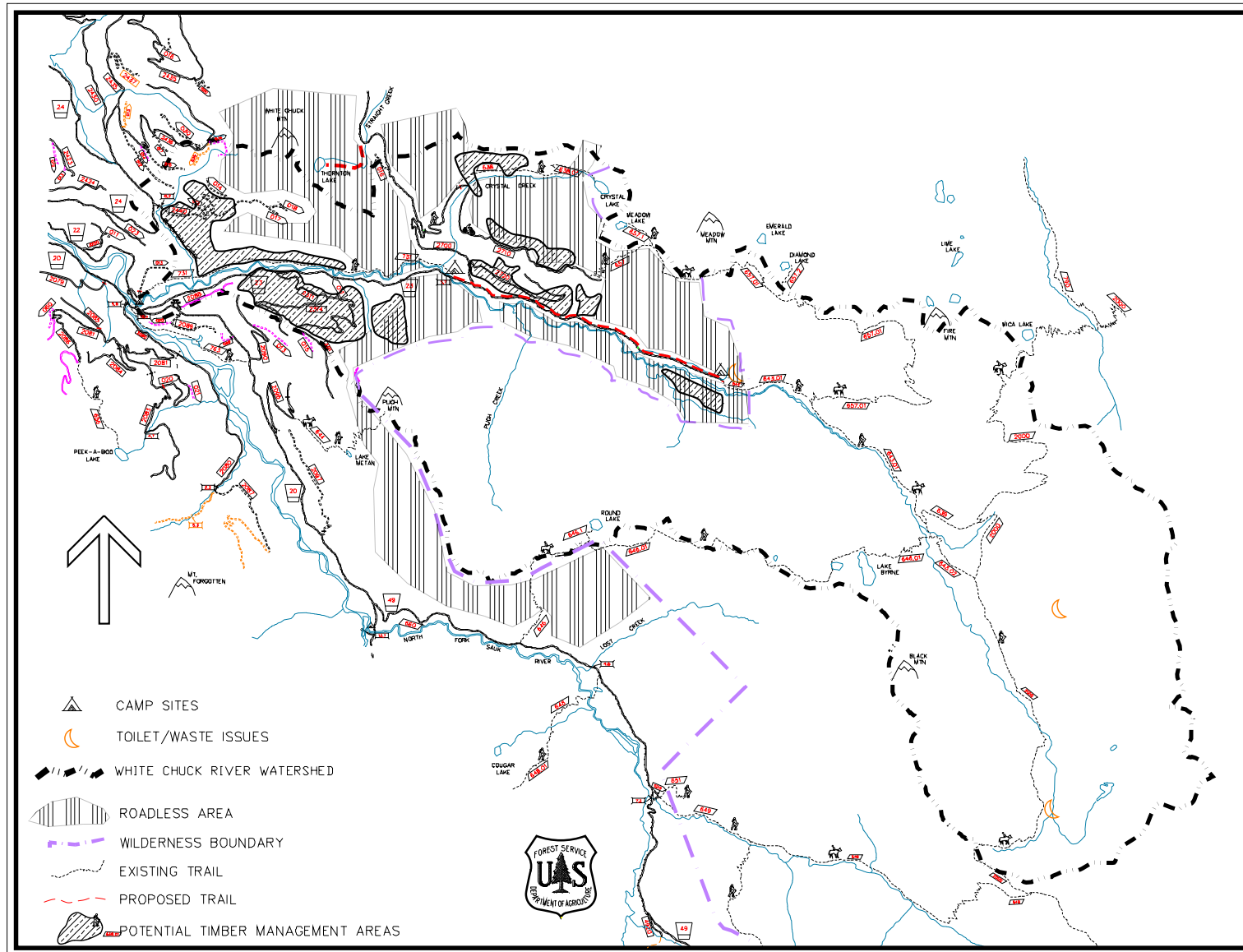


FIGURE 4-3